**THE AFRICAN ASSOCIATION OF INSECT SCIENTISTS**
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# 18th Conference of the African Association of Insect Scientists

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# " Gestion des insectes ravageurs des cultures et vecteurs de maladies pour un environnement viable et une sécurité alimentaire en Afrique: Développements courants"

# "Insect pest and vector management for sustainable environment and food security in Africa: Current developments"

# Programme

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Le Burkina Faso, malgré une production d'arachide estimée à 244 922 tonnes en 2007, connaît des problèmes d'accessibilité à cette denrée, sur le marché local, durant toute l'année. Une des raisons de cette pénurie est la présence de *Caryedon serratus* Olivier, principal insecte responsable des dégâts observés sur l'arachide durant le stockage. Dans la zone ouest du Burkina Faso, 70% de l'arachide conservés sans traitement sont détruits par cet insecte après seulement quatre mois de stockage. Pour réduire l'impact de cet insecte, des études de protection des stocks d'arachide par l'utilisation des substances botaniques ont été menées. Ainsi, les huiles essentielles de *Cymbopogon shoenanthus* (L.) Spreng, de *Hyptis suavolens* Poit., et de *Lippia multiflora* Moldenke, extraites par hydrodistillation à partir des feuilles récoltées en saison humide et en saison sèche au Burkina Faso, ont été testées sur les adultes de *C. serratus* pour évaluer leur efficacité insecticide. L'application des huiles essentielles à une dose comprise entre 10 et 25 µl provoque en 24h une mortalité comprises ente 15 et 100% en fonction des plantes aromatiques, cette mortalité est totale 48 h après l'application et cela quelque soit l'huile essentielle et la dose testée. La $CL_{50}$ en 24 h a varié de 10,41 µl à 15,72 µl pour l'huile extraite de *Hyptis suavolens* récoltés respectivement en saison sèche et en saison humide. Avec *Lippia multiflora* elle est de 6,51µl, par contre avec *Cymbopogon shoenanthus,* la $CL_{50}$ en 24 h a été seulement de 5,17 µl. Ces résultats suggèrent l'utilisation des huiles essentielles pour la protection des stocks d'arachide dans la mesure du possible.

*Mots clés* **:** Arachide – Stockage - *Caryedon serratus* - Huile essentielle – Burkina Faso

**Seasonal variation in species composition and frequency of insecticide resistance alleles (*kdr* and *ace*-1$^r$) in the *Anopheles gambiae* complex from an irrigated rice fields area in Western Burkina Faso.**

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Monitoring of the spread of insecticide resistance in field vector populations is a prerequisite for the implementation of efficient and sustainable vector control strategies based on the use of insecticides. Screening for resistance alleles in *Anopheles gambiae* populations is facilitated by the availability of molecular diagnostics to detect major target-site mutations, such as knock-down resistance (*kdr*) and insensitive acetylcholinesterase (*ace*-1$^R$). *Anopheles gambiae* mosquitoes were collected resting indoors in two villages within a rice cultivation area in western Burkina Faso, from January to December 2007. Specimens were identified to species and molecular form and their genotype at the *kdr* and *ace*-1 locus was determined using PCR and RFLP protocols. The M form was largely predominant in our samples and was present all year round in both villages. S-form mosquitoes gradually appeared during the rainy season in the village at the margins of the rice fields (VK7) whereas it was very rare in the center of the rice cultivation area (VK5) throughout the survey. The frequency of both *kdr* and *ace*-1$^R$ mutations was higher in the S than in the M form at any time. In the M form, frequency of the *kdr* mutation was higher during the rainy season in both villages ($P<0.005$). We report occurrence of the *ace*-1$^R$ mutation in the M form, albeit at a low frequency (<1%). Our results highlight the preoccupying status of insecticide resistance in *An. gambiae* populations from

Burkina Faso, and suggest that comprehensive monitoring strategies need to consider population dynamics.

*Key words* **:** *An. gambiae* s. s., molecular forms, resistance, *kdr*, *ace*-$1^R$, Burkina Faso.

**Parasitization and host feeding behaviour of *Diglyphus isaea* (Walker) on *Liriomyza huidobrensis* (Blanchard) reared on different host plants.**

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*Diglyphus isaea* (Walker) (Hymenoptera, Eulophidae) females oviposit on larger hosts but reject or host-feed on smaller hosts. Host plant association of *D. isaea* is poorly understood in vegetable production systems of Kenya. In the current study, we investigate the parasitization rates and host feeding of *D. isaea* in larvae of *L. huidobrensis* reared on *Pisum sativum*, *Phaseolus vulgaris*, *Solanum lycopersicum* and *Vicia faba*. Infested plants were exposed to adults of *D. isaea* in a choice and no-choice test. 96 hours after parasitoid female ovipostion, parasitization and or host feeding were assessed by dissecting all the mined leaves to observe the developing *D. isaea* larvae next to the leafminer larvae (parasitism) or flaccid larvae with punctures to indicate host feeding. The proportion of larvae that were parasitized was strongly and positively ($R^2$= 0.72, F= 46.15, $P < 0.0001$) correlated with host larval density, but there was no relationship between the proportion of larvae that were host-fed and larval density ($R^2$= 0.14, F= 3.00, $P = 0.1002$). In the no-choice test, the highest parasitism rate was recorded on *P. vulgaris* (46.0 %, SE = 6.2) and least on *V. faba* (8.9 % ± 1.9 percent). In the choice-test however, more larvae were parasitized on *P. sativum* (48.6 % ± 3.9), (highest) than *S. lycopersicum* (48.8 % ± 11.7) (second) and *V. faba* (48.2 % ± 8.0) (third). The percentage of host-fed larvae did not vary among host plants. There are strong indications from this study that crop mixtures can alter the parasitism rates of *L. huidobrensis* by *D. isaea* relative to sole crops. There is thus scope for further greenhouse and field studies on the potential of intercropping as a tool in manipulating parasitization rates by *D. isaea*.

*Key words*: Parasitization, Host feeding, *Liriomyza huidobrensis*, *Pisum sativum*, *Phaseolus vulgaris*, *Solanum lycopersicum* and *Vicia faba*

**Olfactory attraction of egg parasitoids to virgin females of noctuid stemborers**

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To locate hosts, egg parasitoids rely more on infochemicals/semiochemicals of the adult host stage, rather than cues emitted by the inconspicuous eggs themselves. Here, we show that three different egg parasitoid species the scelionids *Telenomus busseolae* Gahan and *Telenomus isis* Polaszek and the trichogrammid *Trichogramma bournieri* Pintureau & Babault were attracted to both calling and non-calling females of the noctuids *Busseola fusca* (Fuller), *Sesamia calamistis* (Hampson) and *Sesamia nonagrioides* (Lefebvre). In Y-tube olfactometer experiments this study revealed a preference of all three parasitoids for non-calling (general odors of virgin females) and calling moth (emitting/releasing sex pheromone) over the control (clean air), and for calling over the non-calling moth. However, the